Space Weather Forecast

Issued on Friday, 15 March 2024 at 13:08 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Slight chance of Moderate-class flares (Minor/Moderate (R1/R2) Radio Blackouts). Chance of reaching S1/Minor Radiation Storm mainly Day 1 (15 Mar).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low, with a long period flare peaking at 15/0610 UTC from the larger region over the west limb. There are now four sunspot regions on the visible disc, with one having faded. All regions are currently small and simple, with the largest region in the southeast starting to fade.

The long period flare produced a Coronal Mass Ejection (CME) directed towards the southwest. Given the location it seems unlikely it will have a significant Earth directed component, however assessment of this event is ongoing.

Solar Wind / Geomagnetic Activity: Solar wind speeds showed signs of a very weak coronal hole fast wind. Wind speeds have been mostly slightly elevated, varying between 370-480 km/s. The Interplanetary Magnetic Field was initially moderate, but declined to become weak. The north-south component varied mostly weakly. Geomagnetic activity was Quiet to Unsettled (Kp 1-3).

Energetic Particles / Solar Radiation: Solar radiation was initially at background levels, but rose slightly after the long period flare. It is currently still below the S1/Minor Radiation storm threshold.

Four-Day Space Weather Forecast Summary

Solar Activity: There is a slight chance of Moderate-class flares, most likely from the region over the west limb on Day 1 (15 Mar). A potential returning region rotating onto the disc late Day 2 or Day 3 (16-17 Mar) contributes to a slight increase in flare risk later in the period, but this is low confidence.

Solar Wind / Geomagnetic Activity: No Earth-directed CMEs are in the current forecast. However, the CME associated with the long period flare this morning is still undergoing analysis. Given the location any interaction at Earth, potentially on Days 2-3 (16-17 Mar) is likely to be mostly shock, however assessment of this event is ongoing. Confidence in the solar wind forecast is relatively low. Several coronal holes are in the forecast, with the potential for weak fast winds, but none are thought likely to give significant impacts at Earth.

Mostly Quiet or Unsettled (Kp 0-3) conditions are expected over the period, with a chance of an Active (Kp 4) interval should a stronger fast wind connection or any CME influence occur, mainly on Days 2-3.

Energetic Particles / Solar Radiation: Solar radiation is currently slightly elevated after the long period flare this morning, with a chance of reaching the S1/Minor Radiation storm threshold. The region responsible rotates well away from the west limb during the period, with a corresponding decline in probability of a radiation storm.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	5	10	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	15	10	20	20
Very Active	R3 to R5 X	No	1	1	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	25	20	10	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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